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Law Enforcement Management Institute of Texas

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A Comparison of the Drag Stabilized .12 Gauge Bean Bag Round Versus the X26 Advanced Taser for the Most Effective Long Range Less Lethal Weapon

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An Administrative Research Paper
Submitted in Partial Fulfillment
Required for Graduation from the
Leadership Command College

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ABSTRACT

The purpose of this paper is to assist police management with selecting the best less lethal resource available today for the line officer. This paper chose two of the most popular and common less lethal resources, the 12 gauge drag stabilized beanbag round and the X26 Taser. This paper compares data and input from officers on both weapons in the areas of ease of use, accuracy, severity of injuries and effectiveness of both, and found that the Taser scored higher in all categories. The results of this paper show that, while some people can argue that both weapons have a place in law enforcement, the Taser X26 is the choice for the patrol officer.

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INTRODUCTION

Law enforcement agencies in America and the world over are faced with the difficulty of responding to calls for police assistance for mentally unstable persons who at times also want to commit suicide, or want the police to facilitate suicide by completing the act for them. In addition, calls are increasing for subjects acting strangely and armed with weapons. The police respond and the suspect is not threatening anyone, but refuses police orders to put down the weapon. These calls require police departments to attempt to subdue the suspect to protect the public and the suspect from themselves. This requires the police to attempt to subdue the suspect while attempting to limit injuries to police and the suspect. Therefore, it is vital for police departments to find the best less lethal weapon to use during these types of calls for service.

Police agencies are constantly searching for the perfect less-lethal weapon that fills the gap between the hands or baton and the use of a lethal weapon in the force continuum. It is the opinion of the author of this paper that a department should have several types of less- lethal weapons at the disposal of the officers. This would allow the patrol officers to choose the proper weapon for the specific task. This would be in the perfect law enforcement world. Few of us, however, work in the perfect law enforcement world where budgets allow the purchase of every item needed or desired. This paper will review data collected on two popular less lethal weapons to determine which less lethal weapon is best suited for patrol use if one had to be chosen.

This paper will compare the drag stabilized bean bag round delivered by a 12-Gauge Shotgun, and the X26 Advanced Taser which delivers electrical current through

two barbed projectiles fired from a hand-held pistol device. The question to be answered is which of the two popular less-lethal weapons would be best suited for patrol use.

The answer to the research question will be determined by examining studies, research papers and technical data to determine the following about each:

- Ease of use
- Accuracy
- Severity of injuries caused by use of the weapon
- Effectiveness of the weapon to disable the suspect

The anticipated outcome of this study is that the X-26 Advanced Taser will be the best selection for daily use by the average patrol officer. This author also anticipates that the study will show that there is a place for both in the law enforcement setting.

This study will give the police administrator who is burdened with the task of choosing between one of the two less- lethal weapons the information to choose the weapon that is the all around best less lethal weapon for the patrol officer.

The specific two weapons are the drag-stabilized beanbag round and the X-26 Advanced Taser.

This review will benefit law enforcement agencies in the search for the best less lethal weapon for the least amount of money. The right choice will benefit law enforcement by allowing officers to safely subdue a violent suspect with little or no injuries to the officer, the innocent citizens or the suspect.

REVIEW OF LITERATURE

The Drag Stabilized Bean Bag Round

Defense Technologies and Federal Laboratories manufacture the drag-stabilized beanbag round. Defense Technologies and Federal Laboratories describe the round as the most accurate 12-gauge specialty ammunition being manufactured today. The manufacturer states that the round is accurate up to sixty feet, although the recommended range is 10 to 40 feet. According to the manufacturer data, this is due to the tear shape aerodynamic design and the tail on the round. The outer layer of the round is made of ballistic fabric, which reduces the chance of tear either in the air or upon impact. (Defense Technologies, 2004).

The bean- bag round being discussed is deployed using the standard .12 gauge police shotgun. (Defense technologies website). This is a weapon that police officers are trained to use and maintain proficiency in its use. This makes the weapon a very easy weapon to use. The problem with using the shotgun as a deployment platform is that most officers do not carry their shotguns with them upon exiting their vehicles. The weapon is not readily available to officers for deployment.

For the beanbag round to administer the physiological impact, it must accurately hit where intended. A study was conducted by the National Tactical Officers Association (NTOA) to determine the accuracy of drag-stabilized rounds and the results were published by Ijames (2000), and the results were as follows:

- The Def Tec round performed perfectly out to 45 feet with each shot striking the X

- At 60 feet, the round had a group average of 3.2 inches, with a maximum deviation of 5 inches from point of aim.

A study was conducted on the injuries caused by the beanbag round in Los Angeles County, and the data collected was from emergency room patients and those brought into the County Morgue in Los Angeles County, California. The lead researcher, Challoner (2001) stated that he reviewed data on 40 cases, 39 males and one female between the age of 16 and 77. The studies goal was to gain data on beanbag injuries and share with emergency room doctors to aid in treating resulting injuries.

The findings were interesting. 39 of the 40 case studies survived. The one fatality was caused by a traditional square shaped beanbag not opening fully and penetrating the chest cavity. The bag broke after penetration and pellets entered the body. Other serious bodily injury included damage to the Thoracic Cavity, eyes, arms and legs. Non- serious included testicular fractures, liver bruising cardiac contusions and minor blunt trauma.

The final findings related to the beanbag show that:

- The beanbag did not always perform as intended, causing serious injuries
- The more severe injuries were caused by the round being deployed improperly by deploying too close or impacting in areas not recommended by the manufacturer. It was unclear in the study if the improper areas were impacted intentionally or were caused by inaccuracy.

A second study was conducted by the Florida Orange County Sheriffs Department and the Florida Gulf Coast University to analyze current less lethal options with specific focus on Tasers. The study is known as the OCSO study. The findings were submitted

orally in a presentation at a SWAT conference by Mesloh (2004). Mesloh (2004) that his study reviewed all use of force reports from 2001-2003 and took a sampling of cases to perform advanced statistical analysis. This study showed that Less Lethal munitions (bean-bag rounds) have an 80% injury rate with the majority of the injuries being bruises/abrasions. The study also concluded that this weapon has a 2% mortality rate (8 deaths per 373 deployments).

The effectiveness of the round is two fold; psychological and physiological. Psychologically, the action of pointing a gun directly at an individual, discharging it, and the individual being struck with a projectile is consistent with one's perception of being shot. This is extremely effective when coupled with surprise tactics. Physiologically, when a projectile strikes a human body, it impacts the body's cells. According to Wall (2002), the speed of the projectile is transformed into the energy that pushes the body's tissue and fluids forward as the projectile moves forward. There's only two outcomes when this happens, blunt or penetrating trauma.

In discussing effectiveness, one has to also look at the availability of the weapon during routine patrol use. The average patrol officer does not exit his or her patrol vehicle with a shotgun equipped with beanbag rounds unless that officer has prior knowledge that this situation will warrant their use. This diminishes the effectiveness of the weapon for routine patrol use.

The X-26 Advanced Taser

The X-26 Advanced Taser is a hand- held weapon that resembles a semi-automatic pistol. The X-26 Advanced Taser is equipped with a laser targeting system for improved accuracy, and uses shaped pulse technology. It fires two probes up to 21 feet

utilizing a replaceable air cartridge. These probes are connected to the weapon by high-voltage insulated wire. The X-26 is different from the early Taser models in that the early Taser models used a lower voltage causing a stunning effect to the suspect. The X-26 uses a new Electro-Muscular Disruption (EMD) technology and can completely override the central nervous system and directly control the skeletal muscles. The probes make contact with the target and the Taser transmits a powerful electrical impulse along the wires and into the body of the target. The probes can transmit through up to two inches of clothing. The EMD causes an uncontrollable contraction of the muscle tissue causing physical debilitation regardless of pain tolerance or mental focus (Taser, 2004).

An advantage of the X-26 Taser is that it is easily transported on a patrol officer's duty belt, making it immediately available to deploy. The X-26 Taser is designed after and operates similar to a typical semi-automatic pistol. Officers are generally required by both departmental and State requirements to maintain proficiency with their handgun. This means that the average officer can be trained on the X-26 Taser without having to learn new skills. The new Taser X-26 is also equipped with a light source and a laser light for easier target acquisition.

Captain Henry Krakowski, Vice president of safety, security and quality assurance with United Airlines, testified before the United States House Aviation Subcommittee on the use of Tasers aboard airlines (2002). Krakowski stated during his testimony that United trained 7000 of their pilots on the use of Tasers. After the training, the pilots were questioned regarding the ease of use of the Taser. Krakowski reported the pilots received the training and became proficient with no problems. Many had little or no experience with a firearm. Pilots reported being surprised at how easy the Taser was

to use. British officers were also trained on the Tasers and similar devices and were required to fill out a questionnaire regarding ease of use, etc. British officers reported (Donnelly, Douse, Gardner, Wilkinson, 2002) that the Taser was easy to point and aim, easy to use and unload, and the trigger and safety switch easy to operate.

The X26 Taser is designed to deploy two barbs discharged by compressed gas. The barbs are attached to wires that the current passes through. Both barbs must make contact with the suspect to be effective (Taser, 2004). Therefore, accuracy is extremely important. Taser Internationals Instructors Manual (2004) claims that the duty cartridge is effective to 21 feet, but the ideal deployment range is 7 to 15 feet. A new cartridge has just become available and extends the distance to 25 feet. A study of the Taser was conducted by the British Columbia office of the police complaint commissioner and was titled Taser Technology review and interim recommendations (2004). According to the study, the Taser x26 experiences a one-foot spread for every seven feet of distance that it travels. The more the spread, the more muscles of the body are affected. Therefore, at seven feet the barbs will strike the target twelve inches apart. At 10 feet the barbs will strike at less than eighteen inches apart. This seems to be an acceptable distance given the body mass of a typical adult. In addition, Taser has included a laser sighting system and a light to assist with accuracy.

A review was also conducted on British officers trained (Donnelly et. al., 2002) and the report claims that of the newly trained officers, 91.9% were accurate with the Taser.

According to the Taser International website, Taser has not been known to cause any deaths directly, and the only injuries are minor abrasions and bruising from the barbs

striking skin. A study by the US Department of Defense Human Effects Center of Excellence (2004) concluded that although there have been deaths that have occurred after the Taser has been deployed, the deaths do not seem to have been from the Taser, but from a medical condition brought on by exertion, drug abuse and several other factors still being studied. Amnesty International disputes this, claiming more than 70 deaths are attributed to Taser (Amnesty, 2004). Interestingly enough, the report by Amnesty states that there is no conclusive evidence that the deaths cited are directly caused by being tased.

Another study conducted by Dr. Charles Mesloh (2004) with Florida Gulf Coast University reviewed 282 field deployments and found that there were no serious injuries caused by the weapon itself. The injuries caused by the weapon were small puncture from the barbs, bruising and some redness around the puncture area. There were seven injuries reported from the suspect falling. Of these seven, six were bruises and abrasions and one was a laceration.

Taser International compiled statistics from 1888 real deployments and reports that there were 1852 none or minor injuries, 23 moderate injuries and 13 severe injuries (Taser, 2004). This shows that severe injuries do occur with the Taser, but they are rare.

Taser International states that it can be fired at a safe distance of 21 feet and is effective on clothing up to 2 inches thick. A spokesman for Taser International said that the most common range is from7 to 15 feet.

A review of less lethal usage and case study was conducted by the Dr. Charles Mesloh, a professor with Florida Gulf Coast University. The study was done in conjunction with the Jefferson County Sheriffs Department (Florida) and was labeled the

OCSO study. According to Mesloh's study (2004), less lethal weapons as a group were immediately effective 70% of the time during real field usage. Mesloh says that the Taser proved to be effective 77% of the time. Total failure occurred 64 times out of 282 deployments. Mesloh's study broke these down and found that the failures were either caused by misses from a distance over 15 feet, a probe coming loose or wire breaking, or clothes baggier than 2 inches.

The Tasers' effectiveness is not affected by the suspect being mentally unstable or under the influence of drugs or alcohol. This is due to the fact that the Taser does not rely on pain to effect compliance. Instead, the Taser uses Electric Muscular Disruption (EMD) to temporarily disable the suspect. This completely takes over the electrical muscular impulses of the suspect's body, causing the suspect's muscles to tighten up and the total loss of muscular function. (Taser, 2004). I have personally experienced this and can testify to its effectiveness. After being struck by the Taser, I was unable to control my muscles or fight through the pain. I fell to the floor, unable to fight, run or do anything until the charge stopped.

One disadvantage is that the Taser will only operate effectively when both barbs are deployed into the suspect. If one barb misses, the Taser is rendered ineffective. The Taser does, however, have a secondary means of deployment. There are probes on the front end of the Taser that, when pressed against the suspect, can deliver the shock to the suspect. This is a stun instead of an EMD.

METHODOLOGY

Law enforcement today has to walk a fine line between using the force necessary to take a non-compliant suspect into custody and not being seen as using unnecessary

force. Critical in this for police chiefs is the protection of officers, the public and even the suspect from unnecessary harm. Also important is the selection of equipment that is easily accessible to the patrol officer and is effective.

The question is as follows: The two most popular extended range less lethal options for police patrol use are the drag stabilized beanbag round deployed by .12 gauge shotgun and the X26 Taser. Of these two options, which less lethal extended range weapon is best for use by the patrol officer?

It is hypothesized that while both weapons have a place in patrol, the X26 Taser is the best choice for the patrol officer to use.

The author of this paper used a wide range of resources. Information was obtained from studies on the two weapons, training manuals, training seminars, law enforcement periodicals, personal experience (the author is an instructor for both types of weapons and has utilized both). The literature was reviewed in an attempt to shed light on the four basic needs to determine the best less lethal weapon for patrol use. They are as follows:

- Ease of use
- Accuracy
- Severity of injuries caused by use of the weapon
- Effectiveness of the weapon to disable the suspect

In addition, a questionnaire was conducted of officers from ten agencies of different sizes and jurisdictions that utilize both weapons. A response was received from two supervisors of the rank of Sergeant, and six patrol officers.

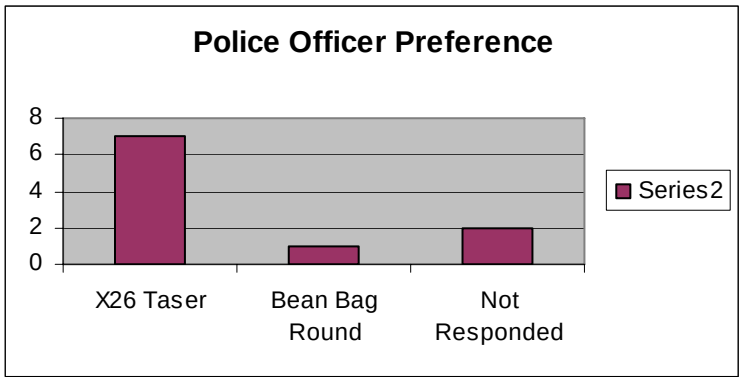
Two agencies did not respond. The questions were simple. They were as follows:

1. How long have both weapons been deployed in the field?
    a. Less than a year
    b. A year or longer
2. Of the two weapons, which type of weapon do you personally prefer?
3. Do you prefer this weapon because:
    a. It is easier to use than the other
    b. It is easily accessible
    c. It is more accurate than the other choice.
    d. It is more effective in stopping the suspect from being a threat.
    e. All of the above
4. Do you feel that there could be a place for both types of weapons in patrol?

FINDINGS

The results of the questionnaire that was submitted concluded that of the eight responding departments, seven of the eight had utilized both weapons for more than one year. All eight said that they felt that both weapons had a place in patrol. Of the eight, seven said that they preferred the Taser to the .12 gauge beanbag round. Of the seven who preferred the Taser, all seven said that they preferred this weapon for all reasons stated. The one who preferred the .12 gauge bean bag round felt that the officer had to be too close to the suspect to effectively deploy the Taser (figure 1).

Figure 1



The author of this paper stated in the introduction of this paper that there are four basic needs that have to be met to determine the best less-lethal weapon for the patrol officer. They are as follows:

- Ease of use
- Accuracy
- Severity of injuries caused by use of the weapon
- Effectiveness of the weapon to disable the suspect

The first need to be discussed is the ease of use. The X26 Taser was designed to fire similar to a pistol. This is a skill that all police officers must have to be a police officer. This eliminates the need to train the officer on a new skill. The X26 is compact and can be worn on the patrol officers' duty belt for instant access. This report cites a case where British officers were trained and immediately required to show proficiency. The study shows a 91.9% accuracy rate with these officers.

The drag-stabilized beanbag round is deployed using a standard police .12-gauge shotgun. Most officers are familiar with the .12 gauge shotgun, but not all. Some officers are unfamiliar and untrained on this weapon. The weapon is long and can be

stored either in the trunk of the police vehicle or in the cab. It is not easily carried with the officer when the officer exits the vehicle on foot patrol. Some female officers are uncomfortable using a shotgun. A conclusion can be made that while both seem fairly easy to use to the average officer, the Taser is easier to access because it is located on the officers duty belt.

The second need to be discussed is the accuracy of both weapons. The X26 states that the probes are effective to 21 feet, but this paper shows that failure is routine after 15 feet. The DefTec beanbag round appears to be accurate at 45 feet. This leads one to conclude that while both are fairly accurate, the beanbag round has a longer range than the Taser. This would cause the officer to be closer to the suspect placing the officer in more immediate danger.

The third need is the severity of injuries caused by the weapon. This paper discussed one study where samplings of beanbag deployments were reviewed. According to Mesloh, there was a 2% mortality rate with the beanbag round and an 80% injury rate with the majority of the beanbag injuries being bruises and abrasions. (Mesloh, 2004). The X26 Taser has not had any deaths attributed to the weapon. As stated earlier in this paper, there have been instances where the suspect has died after being tased, but experts attribute this to a fairly new medical phenomenon that has nothing to do with the workings of the Taser. Mesloh's study reviewed 282 uses and there were only seven injuries reported. The seven injuries were reported to be bruises, abrasions and one laceration. This paper shows that both types of weapons have the capability of causing injuries ranging from minor to severe. The beanbag round is the only one, however that has documented deaths related directly to its use.

Finally, the final need is the need to determine effectiveness. This paper found that the effectiveness of the beanbag round is derived from physiological and psychological effects. Pointing a weapon at the suspect causes the psychological effect. It is hoped that merely pointing a weapon at the suspect will cause the suspect to re- think their actions and surrender. It is also felt that the loud explosion caused by the discharge of the round will also cause the suspect to think that they have been shot and give up. The physiological effect is caused by pain compliance from the beanbag striking the suspect. This paper shows that these primarily work when the suspect is sane and sober.

The Tasers effectiveness is also derived in part from the psychological effects to the suspect. This paper cites studies that show merely pointing the laser sight at the suspect sometimes causes the psychological effect.

The primary effectiveness, however, is caused by the electro muscular reaction from the electrical pulses caused by the Taser. This paper looked at research concerning this and found that if both barbs enter the suspect or can penetrate the suspects clothing, the electro muscular charge will disable the suspect regardless of the suspects mental or physical condition. A conclusion can be made that the beanbag round is effective most of the time, but can be affected by mental or chemical impairment. The Taser seems to be effective almost every time that it is correctly deployed and is not affected by mental or chemical impairment.

DISCUSSION

The problem addressed in this paper is that today's police departments are constantly faced with the emotionally or chemically induced suspect acting irrationally and brandishing a weapon. The police are required to take the suspect into custody while

trying to inflict as little damage to the suspect or officers as possible. Patrol officers need a less lethal weapon that is easily accessible and easy to use, accurate, and accomplish the task with little or no injuries. The purpose of this paper is to review data on two types of less lethal weapons in an effort to determine which of the two would be the best choice for use by the patrol officer. The weapons discussed in this paper were the .12-gauge beanbag round manufactured by Deftech Corporation, and the Taser x26 manufactured by Taser International Corporation. The author of this paper hypothesized that the Taser X26 would be the best selection for patrol use, but that there is still al place for both in law enforcement.

The findings of this paper show several interesting things, and the survey was first. All officers surveyed felt that both weapons have a place in patrol. Seven of the eight preferred the Taser x26 to the beanbag round. All seven felt that the X26 was easier to use, easier to access, more accurate, and more effective in stopping the suspect from being a threat. The author understands from years of being a patrol officer first, then an instructor and supervisor, that it is important for the success of a new project or officer tool that the officers are comfortable with its use.

As stated many times in this paper, there are four basic needs to determine the best less lethal weapon for the patrol officer. They are the ease of use, accuracy of the weapon, severity of injuries caused by use of the weapon, and the effectiveness of the weapon to disable the suspect. This paper found that in three of the four categories, the Taser X26 excelled.

- The Taser is easier for all officers to use due to its pistol design and ability to be easily carried on the officer's belt. The study found that it was easy to train even a non police officer on the weapon in a short time.
- The Taser and the beanbag round were both fairly accurate, but the beanbag round was accurate at a longer distance. The beanbag round was accurate to 45 feet and the Taser was accurate to 15 feet. The Taser requires the officer to be closer to the suspect to deploy, placing the officer in greater danger.
- The Taser came out a winner in the area of injuries. Taser X26 has not had any official deaths attributed to it's use, although experts agree that it is still too early to make any final judgments on this yet. The Taser can cause injuries ranging from minor bruises, burns and abrasions to some more severe when placement is off. The beanbag round has been responsible for verified deaths, although most have been caused by the beanbag striking areas that are unsafe, or by the round malfunctioning.
- On the effectiveness of the weapon, Taser again appears to be the winner. A conclusion can be made that the beanbag round is effective most of the time, but can be affected by mental or chemical impairment. Taser, if correctly deployed, can cause complete incapacitation of the suspect for the duration of the charge. The effect is not diminished by the suspect's mental or chemical incapacitation.

The hypothesis is correct in this paper. The paper shows that while there is still a place for the beanbag round, the Taser is clearly the best choice for the patrol officer.

This study was difficult due to the limited information in print on the Taser X26 and many still unanswered questions regarding the Taser. Most of the data on the Taser has

been gathered by the manufacturer which is not always the best information. The information, however did seem to be fair.

The information in this study should shed some insight into the available information on the Deftech beanbag round and the Taser X6.It is hoped that this information will help the police administrator make the correct determination when faced with the task of making a decision between the two.

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